

Application No. 10/534,438
Response to Office Action dated 12/06/2007

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Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1. (Currently Amended) A laser module, comprising:

a sub-mount;

a semiconductor laser secured to a surface of the sub-mount; and

an optical waveguide device joined to the surface of the sub-mount by an adhesive layer so that the optical waveguide device is coupled optically with the semiconductor laser,

wherein a first groove is formed at the surface of the sub-mount at a region corresponding to an incident end side of the optical waveguide device, the first groove being formed parallel to an outgoing end face of the semiconductor laser with a predetermined space therefrom, and

the adhesive layer is formed as a single layer provided under the optical waveguide device ranging from a surface of the sub-mount to the inside of the first groove, so that an end portion of the adhesive layer on the incident end side of the optical waveguide device is positioned inside the first groove so as to adhere to a surface of a wall of the first groove under the optical waveguide device and does not contact with the outgoing end face of the semiconductor laser.

2. (Original) The laser module according to claim 1, wherein a distance D between the outgoing end face of the semiconductor laser and a proximal end of the adhesive layer satisfies $0 \text{ mm} < D < 0.2 \text{ mm}$.

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3. (Original) The laser module according to claim 1, wherein the adhesive layer is provided partially at one position close to an incident end face of the optical waveguide device.
4. (Original) The laser module according to claim 1, wherein the adhesive layer is provided partially at least at two positions, close to an incident end face of the optical waveguide device and close to an outgoing end face of the optical waveguide device.
5. (Original) The laser module according to claim 4,
wherein a second groove is formed at the surface of the sub-mount at a region corresponding to an outgoing end side of the optical waveguide device, the second groove being formed parallel to the outgoing end face of the optical waveguide device, and
the adhesive layer close to the outgoing end face is provided along the second groove.
6. (Original) The laser module according to claim 4, wherein an area of the adhesive layer close to the incident end face is larger than an area of the adhesive layer close to the outgoing end face.
7. (Previously Presented) The laser module according to claim 1, wherein a second groove is formed at the surface of the sub-mount at a region corresponding to the incident end side of the optical waveguide device, the second groove being formed parallel to the first groove and being positioned between the first groove and the outgoing end face of the optical waveguide device.
8. (Previously Presented) The laser module according to claim 7, wherein a distance L_1 between the first groove and the second groove satisfies $1\text{ mm} < L_1 < L/2$, where L denotes a length of the optical waveguide device.

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9. (Previously Presented) The laser module according to claim 5, wherein a third groove is formed at the surface of the sub-mount at a region corresponding to the outgoing end side of the optical waveguide device, the third groove being formed parallel to the second groove and being positioned between the second groove and the incident end face of the optical waveguide device.

10. (Previously Presented) The laser module according to claim 9, wherein a distance L_2 between the second groove and the third groove satisfies $1 \text{ mm} < L_2 < L/2$, where L denotes a length of the optical waveguide device.

11. (Original) The laser module according to claim 1, wherein a thickness T_1 of the optical waveguide device satisfies $T_1 < 1 \text{ mm}$.

12. (Original) The laser module according to claim 1, wherein a width W of the optical waveguide device satisfies $W < 0.85 \text{ mm}$.

13. (Original) The laser module according to claim 1, wherein a length L of the optical waveguide device satisfies $L > 10 \text{ mm}$.

14. (Original) The laser module according to claim 1, wherein a thickness T_2 of the sub-mount satisfies $T_2 < 0.3 \text{ mm}$.

15. (Original) The laser module according to claim 1, wherein the optical waveguide device is a quasi-phase-matched second harmonic generation (QPM-SHG) device.

16. (Original) The laser module according to claim 1, wherein the optical waveguide device is an optical fiber.

17-20. (Canceled)